Antifungal activity of chitosan against Fusarium oxysporum f. sp. cubense.

ABSTRACT

The in vitro antifungal activity of chitosan against Fusarium oxysporum f. sp. cubense Race 4 (FocR4) the causal agent of banana wilt was investigated. Chitosan at all concentrations tested reduced the hyphal growth of FocR4 on potato dextrose agar media and recording maximum inhibition of 76.36% at 8 mg/mL. The inhibitory effect was found to increase as chitosan concentration increases. The 50% effective concentration value was estimated by probit analysis, and it was 1.4 mg/mL. Chitosan was more effective in potato dextrose broth where it completely inhibited the mycelial growth of FocR4 at all concentrations tested. Chitosan inhibited the sporulation of FocR4 by a maximum of 96.53% at 8 mg/mL chitosan, and 100% inhibition for spore germination was recorded at all concentrations tested. Chitosan at concentrations of more than 1.6 mg/mL was also found to induce morphological changes in FocR4 characterized by agglomeration of hyphae, abnormal shapes, vesicles, or empty cells devoid of cytoplasm in the mycelia.

Keyword: Chitosan; Fusarium oxysporum; Antifungal; Banana wilt.